STREAM NAME A DES	1-14:7	LOCATION IPSD - TT 3001
STATION # RI		STREAM CLASS
LATLC)NG	RIVER BASIN
STORET #		AGENCY
INVESTIGATORS R	ser's O Neil	ĺ,
FORM COMPLETED BY		DATE 120 AM PM REASON FOR SURVEY TIME 120 AM PM TIME 5000109
WEATHER CONDITIONS	□ rain (□ shower 40%□ %c	Past 24 Has there been a heavy rain in the last 7 days? hours Ayes No Navy rain (steady rain) rs (intermittent) cloud cover lear/sunny Past 24 Has there been a heavy rain in the last 7 days? Air Temperature 75° F T-54° I M 6 / 6
SITE LOCATION/MAP	Draw a map of the si	ite and indicate the areas sampled (or attach a photograph)
	1 Nort	Clump Tousestite Sample callected IN Small interior just of stream just of stream
STREAM CHARACTERIZATION	Stream Subsystem Perennial In Stream Origin Glacial Non-glacial montan Swamp and bog	Stream Type Coldwater Warmwater

WATERSHED FEATURES	Predominant Surrounding Landuse Forest	Local Watershed NPS Pollution No evidence Some potential sources Obvious sources Local Watershed Erosion None Moderate Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the do Shrubs dominant species present Willow, Management	ed male, all beny pupe la
INSTREAM FEATURES	Estimated Reach Length Estimated Stream Width Sampling Reach Area Area in km² (m²x 1000) Estimated Stream Depth Surface Velocity (at thalweg) Chain. Low flow@	Canopy Cover O Parily open O Parily shaded O Shaded O Jow High Water Mark Proportion of Reach Represented by Stream Morphology Types O Run O % O Pool S % Channelized O Yes No
LARGE WOODY DEBRIS	LWD	reach ureā)
AQUATIC VEGETATION	Indicate the dominant type and record the do BRooted emergent Rooted submerge Attached Algae dominant species present Portion of the reach with aquatic vegetation	nt O Rooted floating O Free floating
WATER QUALITY	Temperature 21.65°C Specific Conductance 346,60 Dissolved Oxygen 5,46 pH 749 Turbidity 5,0 NT W WQ Instrument Used YST	Water Odors Normal/None Sewage Chemical Chemical Fishy Other Water Surface Oils Globs Flecks Slick Sheen Globs Flecks None Other Clear Slightly turbid Turbid Opaque Stained Other
SEDIMENT/ SUBSTRATE	Odors Normal Sewage Petroleum Chemical Anaerobic None Other Oils Absent Slight Moderate Profus	Deposits Sludge Sawdust Paper fiber Sand Relict shells Other Non S. Looking at stones which are not deeply embedded, are the undersides black in color?
INORGANIC SUE (should	SSTRATE COMPONENTS add up to 100%)	ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	% Composition in Sampling Area	
Bedrock		\bigcirc	Detritus	sticks, wood, coarse plant	(7)
Boulder	> 256 mm (10")	0	1	materials (CPOM)	150
Cobble	64-256 mm (2.5"-10")	Ö	Muck-Mud	black, very fine organic	
Gravel	2-64 mm (0.1"-2.5")	0	1	(FPOM)	150
Sand	0.06-2mm (gritty)	10 %	Marl	grey, shell fragments	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Silt	0.004-0.06 mm	90 91	1		479
Clay	< 0.004 mm (slick)	7	1		6 00

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAMNAME Aberiona River	LOCATION IPSD-TT3001-5wth of Swlam St
STATION # 20-0 RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS KONES O'N	leill, Hoskins on 6/21
FORM COMPLETED BY	TIME 1:30 AM PM REASON FOR SURVEY

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking
	17	banks, cobble or other stable habital and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and not transient).	populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	removed.	
rach	SCORE	20% 18 : 18 : 18 : 18 : 18 : 18 : 18 : 18		£10(5,941,83217.)1.64	155.40.3 marche 0
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat, no submerged vegetation.	Hard-pan clay or bedrook no root mat or vegetation
uated	SCORE	20 19 18 4 17 16	a15 (14) 13 12 11	10 9 8 7 6	5 44 33 2 1 (
s to be evalu	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
mete	SCORE C	20 19 218 17 16	152 4 2 2 2 1	10 9 8 7 6	5 4 3.7 1.1
Parar	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pocalmost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	机多数据 19512316	\$107.9% 8 d + 6.	25 A-37 25 MM (
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools
	SCORE	20 19 18 17 16	-15%-14 x 13 12 11	10 9 8 7 4 6	5 4 3 2 1

Sould so

complete and service peat

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	Alteration dredging absent or minimal; stream with normal pattern.		Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted Instream habitat greatly altered or removed entirely.
	SCORE	20 . 19 . 18 (17) 16	SI SINCE AND COLOR	710 9 - 8-E7 - 6	3 4 Media 20
ipling reach	7. Channel - Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length I to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
Eas	SCORE	20年49時18日初年16	A SA MARKE AND TOTAL	10 9 8 9 8 8	15 4 3 2 1720
be evaluated broader than sampling reach	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional sears.
to be eval	SCORE $\frac{9}{9}$ (LB) SCORE $\frac{9}{9}$ (RB)	Left Bank # 10 (g) in Right Bank 5 10 (9)		\$650 049-4436 \$45 . W. S. W.	**************************************
Parameters	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high, vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE \underline{D} (LB) SCORE \underline{D} (RB)	Chronia (O)		Mark School School	Sen Action to Anna Contract of Contract
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12, 18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE (LB) SCORE (LB)	Left Bank 10 9 Right Bank (10) 9	8 7 (9)		2 1 2 0

Total Score 140

STREAM NAME Oh 1	LOCATION_DSD-PP03			
STATION # PPO3 RI	lips Pond	STREAM CLAS		
LATLC)NG	RIVER BASIN		
STORET#		AGENCY		
INVESTIGATORS	oberts N'N	leill.		
FORM COMPLETED BY	5	DATE 6/25/ TIME 10:10	61 - MPM	REASON FOR SURVEY Triad Sampling
	r			
WEATHER CONDITIONS	rain (s showers 20% %cl	(heavy rain) steady rain) s (intermittent) oud cover ear/sunny	Past 24 hours	Has there been a heavy rain in the last 7 days? EXYES No 5 MOWERS 6/25 Air Temperature 76° F Other
SITE LOCATION MAP	Draw a map of the site.	Louise her Boat	e areas samp	n 30' forested out fer on south shore
STREAM CHARACTERIZATION	Stream Subsystem Perennial Inter Stream Origin Glacial Non-glacial montane Swamp and bog	rmittent 🔾 Tida Spring-fed Mixture of Other	l f origins	Stream Type Coldwater Warmwater Catchment Areakm²

WATERS FEATUR		Predon De Fores De Field De Agric Resid	ninant Surrounding Lan that (2) Ma Comme (Pasture Industri cultural Industri lential	eduse ercial al Highwa	Local Watershed NPS No evidence Som Obvious sources Local Watershed Eros None Moderate		
RIPARIA VEGETA (18 meter	TION buffer)	Indicat D Trees domina	e the dominant type and Si int species present	record the do arubs Maple	ominant species present AH D Grasses buck their ledle	erbaceous	
INSTRE FEATUR		Estima Sampli Area in Estima		St. Jan +	High Water Mark Proportion of Reach R Morphology Types Riffle % UAPool_/AA % Channelized D Yes	Represented by Stream	m at at
LARGE V DEBRIS	WOODY	LWD Density	of LWDm	n²/km² (LWD/	0% NON.		OCT IE
				I record the do ooted submerge ttached Algae	ominant species present ent	☐ Free floating	
		Portion	of the reach with aqual	tic vegetation	<u> </u>		
WATER TOLE OF ©	Dissolved Oxygen Q. 7 pH 6.68 Turbidity 2.3 N WQ Instrument Used			Solved Oxygen 0.74 mg/ Water Surface Oils Globs Flecks which is a surface oils Sheen Globs Sheen			
SEDIME SUBSTR	NT/ ATE	Odors B Norm O Chen O Other	nical Anaerobic	O Petroleum O None	Deposits O Sludge O Sawdust O Relict shells	D Paper fiber D Sand Other DONE	
		Oils	nt 🗆 Slight 🗀 Modera	te 🖸 Profu	are the undersides blace	ch are not deeply embedded, ck in color?	
IN	ORGANIC SUBS		COMPONENTS 100%)		ORGANIC SUBSTRATE C		
Substrate Type	Diamete	er	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area	
Bedrock Boulder	> 256 mm (10 th) ³		0	Detritus	sticks, wood, coarse plant materials (CPOM)	16%	
Cobble Gravel	64-256 mm (2.5"-10") 2-64 mm (0.1"-2.5")		8 .	Muck-Mud	black, very fine organic (FPOM)	1 6 %	
Sand	0.06-2mm (gritty	y)	0	Mari	grey, shell fragments		
Silt	0.004-0.06 mm		10092			\bigcirc	
Clay	< 0.004 mm (slic	-k)	0 70	1			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAMNAME Phillips tond	LOCATION IPSD - PP03
STATION # 17500 4 RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS ROBERTS O'NI	
FORM COMPLETED BY ROBELT 5	DATE 6/25/01 TIME 10:10 AM PM Trad Scarpling

	Habitat		Condition	Category	
1 1	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks; cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
each	SCORE	202 19: 18 172516		110 9 874 74 67	3- 4/38 26 A > 0
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat, no submerged vegetation.	Hard-pan clay or bedrock, no root mat or vegetation.
uate	SCORE	20 - 19 - 18 - 17 - 16	13-12-11	10 9 (8) 7. 6.	55+ 40-30, 20-1 D
ers to be eva	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
E E	SCORE	20 - 19 4 18 177 16	到5 期间 最134-12 2:11:	10 209 8p 8p 5	55 43-36 x 2 x 1 / 0c
Para	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected, sediment	Heavy deposits of fine material increased bar development; more than 80% of the bottom changing frequently; pools
	2	·	d eposition in pools.	deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	almost absent due to substantial sediment deposition.
	SCORE	20 - 19 - 18 - 17 4	57 30 (8) 20 (2 2) (2	10 - 9 - 8 174 6	K5 4 3 (2) 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20/19 18 17 16	13 12 11 12 11 12 11 12 11 11 12 11 11 11	10 9 8 7 6	5 4 3 2 7 1 0

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HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement, over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE	20 - 19 - 18 - 17 - 16	115 H 12 113 2 113.	-10 95 3'8 7 6	5 4 3 2 1 0
plingreach	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight, waterway has been channelized for a long distance.
Eas	SCORE '	20 ×19 18 17 18	NAME OF THE PARTY OF THE	40 - 9: 28 - 3.3.6	5) 4 3 .2 -1 0s
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has
to be eval	SCORE (LB) SCORE (RB)	Left Bank 10 10 11		ir iddəsə və is. Vəfatlar	erosional scars.
Parameters t	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE (LB) SCORE (RB)	Left Banket and Co.		PHORESON TO SERVICE AND ADDRESS OF THE PROPERTY OF THE PROPERT	2 2 2 1 2016 2 2 3 2 1 2016
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12- 18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE 3 (LB)	Left Bank 10 9	8 7 6	5 4 (3)	2 1 , 0
	SCORE 4 (RB)	Right Bank 10 9 -	876	$(40.5)^{\circ}$ $\left(\frac{3}{4}\right)$ (37.5)	2 1 0 3

Total Score 102

STREAM NAME SO. B	LAPPINA R LOCATION TOSD - TTSAOI	
STATION # 5AOL R	IVERMILE STREAM CLASS	
LATL	ONG RIVER BASIN	
STORET#	AGENCY	
INVESTIGATORS	oborts. O'Neille Munrelt Rosia, do May	
FORM COMPLETED BY	TIME	
N.E. THER		
WEATHER CONDITIONS	Now Past 24 Has there been a heavy rain in the last 7 days? hours \(\text{P'es} \text{No Showers } \frac{1}{2} \div \text{V} \delta \)	
_	storm (heavy rain) rain (steady rain) Air Temperature \$ 50 \ 50 \ 50 \ 50 \ 50 \ 50 \ 50 \ 50	
	showers (intermittent) O Other	
	Clear/sunny	
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)	
1	gradient territoria	
	1,79%	
	$/\sim_{\mathcal{M}_1}$	
	Arcadia Road de Sac at sampling is Catilals It	
	Arcodia	
	Road de Sac at sampling of Catials (to Stunt calobo	Sako
	tood de Sac / at surperil	1
	Catials (t	roid- Will
	(Kurt calot)	452
	ewilves	J
	PFO BANKIT DE purple loc	1851 .
	PFO BANKIT PFO furple lock	Cor J
		(· · · · · · · · · · · · · · · · · · ·
	M. Carrier San Car	
	8/20 S	
	Phulips 3	
	To Sylving Very State	
	Roto Serry Sight Flow	
	148/20	
STREAM CHARACTERIZATION	Stream Subsystem Stream Type Perennial Intermittent Tidal Coldwater Stream Type Warmwater	
ļ	Stream Origin Catchment Areakm²	
	☐ Glacial ☐ Spring-fed ☐ Mixture of origins ☐ Swamp and bog ☐ Other ☐ Glacial montane ☐ Swamp and bog ☐ Swamp	
	, , , , , , , , , , , , , , , , , , , ,	

TTSAOI

WATER FEATUR		☐ Field ☐ Agri	d/Pasture	nercial rial	Local Watershed NPS No evidence Sor Obvious sources	Tax I UN-9/		
		Resi	dential		Local Watershed Ero None Moderate	sion //		
RIPARIA VEGETA (18 meter	AN ATION r buffer)	11 '	Indicate the dominant type and record the dominant species present AHerbaceous dominant species present with the dominant species present with					
	Estimated Reach Length							
LARGE DEBRIS	RGE WOODY LWD - 1596						(
	AQUATIC VEGETATION Indicate the dominant type and record the dominant species present Rooted emergent Rooted submergent Attached Algae dominant species present Rooted Rooted Rooting Portion of the reach with aquatic vegetation O %							
WATER QUALITY Temp Special Dissol			Temperature					
1 11		WQ Instrument Used YSI ORP-58, 2 V			Turbidity (if not meas Clear Slightly to Opaque Stained	ured) Irbid		
SUBSTRATE No.		Odors M Norm O Chem	nical 🖸 Anaerobic	Deposits Sludge Sawdust Paper fiber Sand None Relict shells				
Ojls AAbs			nt 🗆 Slight 🕒 Modera	ite 🔾 Profu	are the undersides blad	h are not deeply embedded, k in color?		
INC	ORGANIC SUBS	STRATE dd up to I	COMPONENTS		ORGANIC SUBSTRATE C			
Substrate Type	Diamete	r	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area		
Bedrock Boulder	> 256 mm (10")			Detritus	sticks, wood, coarse plant materials (CPOM)	Z-0		
Cobble Gravel	64-256 mm (2.5 2-64 mm (0.1"-2	/	8	Muck-Mud	black, very fine organic (FPOM)	50		
Sand	0.06-2mm (gritty		30	Mari	grey, shell fragments			
Silt	0.004-0.06 mm		70	1	Brey, shen tragments	\ \alpha		
Clay	< 0.004 mm (slic	:k)	T T	1	1	l <i>()</i>		

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME So. B. A Derong Kin	LOCATION TPSD-TTSANI
STATION # 15A01 RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS KOLETS, D'N	eill Murrey
FORM COMPLETED BY	TIME 200 AM PM Triad Sanoling

	Habitat		Condition	Category	V]
	Parameter	Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization putential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed)	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
each	SCORE	20-193-182-174-16-	21274001 32122112	(10-9-8-7.5.6	5 4.3 25150
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
uate	SCORE	20 19 18 17 16	415-14 - 13 12 11	10 9 8 7 6	5 4 3, 2 1, 0
ers to be eva	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
mete	SCORE	20 19 18: 17: 167	和5跨195298至12台山	-10 - 9 8 <i>- 9</i> 6	15 4 3 2 U O
Parai	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends, moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	到5页样的 12 711	*10 9 8 A 6	5 4 3 2 15 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or nifle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted	Banks shored with gabion or cement, over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE	20. (19) 78 77 16	15-48-8019 March 11	10 9 8 57 6	5 4 3 2 1 0.
pling reach	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
mas r	SCORE	20::19:18:17:16	715 (1417) 1330 12781 C.	10'- 9"- 8"-7 + 6	5 4 3 2 <u>1</u> 0
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank) SCORE (LB) SCORE (RB)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
to be eva		Left Bank issa 10 9 Right Bank 10 9	8 54 7 18 6 5	5 4 3	1.2 ***1 .20 ** 2 ***1 .20 (
Parameters (9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common, less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE (LB) SCORE (RB)	Left Bank 10 9 = Right Bank 10 9 =	Late Cherry	terra di sa	2 1 0 0 · · · · · · · · · · · · · · · · ·
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12- 18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE (LB) SCORE (RB)	Left Bank 10 9 Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 126

Tore.
6-8 r
W. Se ble
in parts
that

STREAM NAME So &	LOCATION TPSD-TTSDOI				
STATION#775001 R	IVERMILE	STREAM CLASS			
LATL(ONG	RIVER BASIN			
STORET#	AGENCY				
INVESTIGATORS (2)	erts O'M	ell. Le	SIU.	to May	
FORM COMPLETED BY	rts	DATE 67	STOI	REASON FOR SURVEY	
WEATHER CONDITIONS	rain (showers	(heavy rain) steady rain) (intermittent) loud cover ar/sunny	Past 24 hours	Has there been a heavy rain in the last 7 days? Yes No Air Temperature° C Other	
SITE LOCATION/MAP	Draw a map of the site			pled (or attach a photograph)	
			Les de sa	~	
STREAM CHARACTERIZATION	Stream Subsystem A Perennial Inte Stream Origin Glacial Non-glacial montane Swamp and bog	Spring-fee	i f prigins	Stream Type Coldwater Catchment Areakm²	

	WATERS FEATUR		Field	/Pasture	ercial ial	Local Watershed NPS No evidence Son Obvious sources			
			Access			Local Watershed Eros None	O Heavy		
	RIPARIA VEGETA (18 meter	TION		e the dominant type and		ominant species present AH	erbaceous urclineed, Sinsitu	e (
ブ	INSTREA FEATUR		Estima Sampli Area in Estima	ted Reach Length ted Stream Width Ing Reach Area S km² (m'x1000) ted Stream Depth Velocity Wellocity	4",	Canopy Cover Partly open High Water Mark Proportion of Reach R Morphology Types Riffle Pool %	ly shaded		
			(at thai	weg)	Cana Aa	Channelized Yes Dam Present Yes			
₹	LARGE V DEBRIS	УОО БУ	LWD Density	1070 total	n²/km² (LWĐ/		94140		
	AQUATIO VEGETA	TION	Indicate the dominant type and record the dominant species present Rooted emergent Rooted submergent Rooted floating						
			1	of the reach with aqua	1	, · · · · · · · · · · · · · · · · · · ·			
	Specific C			cature <u>24.7</u> °C Conductance <u>A7.0</u> °C ed Oxygen <u>4.47</u>	50 0 M	☐ Petroleum □	Normal/None Sewage Petroleum Chemical		
			р Н _	93 1.5NTU	,	Water Surface Oils Slick Sheen None Other			
			WQ In	strument Used 15		Turbidity (if not meass C) Clear C) Slightly tu C) Opaque C) Stained	red) rbid		
				ical Anaerobic	☐ Petroleum ☐ None	Deposits Sludge Sawdust, Relict shells	Other Of Sand		
			Gils Abser	Some Sulfident O Slight O Modera		are the undersides blac	h are not deeply embedded, k in color?		
INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)						ORGANIC SUBSTRATE C			
	Substrate Type	Diamete	er	% Composition in Sampling Reach	Substrate Type	Characterístic	% Composition in Sampling Area		
İ	Bedrock		٠,	0	Detritus	sticks, wood, coarse plant			
[Boulder	> 256 mm (10")		Ö		materials (CPOM)	50		
	Cobble	64-256 mm (2.5	"-10")	0	Muck-Mud	black, very fine organic			
-	Gravel	2-64 mm (0.1"-2	.5")	0	<u></u>	(FPOM)	<i>30</i>		
-	Sand	0.06-2mm (gritt)	/)	15	Mari	grey, shell fragments			
、 ŀ	Silt	0.004-0.06 mm		90					
L	Clay	< 0.004 mm (slick)							

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME SO. BI. ADD ONA	LOCATION IPSO-T-T-SD D			
STATION # RIVERMILE	STREAM CLASS			
LATLONG	RIVER BASIN			
STORET #	AGENCY			
INVESTIGATORS Koherts, &	Cosin O'Neil (Le May)			
FORM COMPLETED BY	TIME 4:15 AM PM REASON FOR SURVEY TIME 4:15 AM PM Sur plans			

	Habitat		Condition	Category	
	Parameter	Optimal .	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	substrate/ epifaunal colonization and		10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
each	SCORE	201219: 18-5174:163	(A) (E) (E) (A) (A) (A)	10 · 9 · 8 - 7 · 6/1	1456 4.: 3. 24. 12. 0
be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All myd or clay or sand bottom; little or no root mat, no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
ua te	SCORE	20.: 19.: 18.: 17.: 16.	1130123135-12(11)	10 9 8 7 6	5 4 3 2 1 0
Parameters to be eva	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
a et	SCORE	20 19 18 17 16	105-29 - 23 - 12 - 11	10 9 (8) 17 6	35 · 4 · 3 · 2 · 1 · 0
Para	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 - 17 16	DS 14 13 12 11	(19) 9 8 7 - 6"	5 4: 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or rifle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 (16)	刘3洲4号13 12 11	10 9 8 7 6	5-4-3-2-1-0



HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

	Habitat		Condition Category			
- 1	Parameter	Optimal	Suboptimal	Marginal	Poor	
3 1	6. Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern.		Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
Į	SCORE	20 19 18 17 16	is is all the second	10 : 9 38 . 7. 6	5 4 3 2 1 .0	
npling reach	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.	
2	SCORE	20 19 18 17 16	alsau dedüüle	10.9 + 8 4.7 - 6	5 4 3 2 1 0	
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has	
evalı	SCORE (LB)	Lea Delle Con	**************************************	Harris Andrews	erosional scars.	
to be	SCORE (LB) SCORE (RB)	Right Bank 10, (9)	7 - 22 - 24 - 25 -	A NAME OF THE PARTY OF THE PART	4-12-4-1 0 E	
Parameters to	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.		Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.	
	SCORE (LB) SCORE (RB)	Left Bank 10 (9) Right Bank 210 (9)	NAMES OF THE PERSON OF	SECTION CON	1-2-1 0-	
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12- 18 meters; human activities have impacted zone only minimally.		Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.	
	SCORE (LB) SCORE (RB)	Left Bank 10 (9) Right Bank 10 (9)	8 7 6	5 4 3	2 1 0	

Total Score 143

STREAM NAME Ahr	DONG KIMPETEL	LOCATION	TF	SD-TTA003	
STATION#TTAOO3 R	IVERMILE	STREAM CLASS			
LATL	ONG	RIVER BASIN			
STORET#		AGENCY			
INVESTIGATORS R	110015 8	Sosiu	0'1	aill	
FORM COMPLETED BY	45	DATE 11:3	27/01 am pm	REASON FOR SURVEY Triad Sampling	
WEATHER CONDITIONS	rain (: showers %0, %cl	(heavy rain) steady rain) s (intermittent) loud cover aar/sunny	hours 50	Has there been a heavy rain in the last 7 days? Yes PNO YES 6/24 Air Temperature 75° Other	
SITE LOCATION/MAP	Draw a map of the site	e and indicate th	·	ed (or attach a photograph)	
STREAM CHARACTERIZATION	Stream Subsystem Perennial Inte Stream Origin Glacial Non-glacial montane Swamp and bog	Ermittent 🖸 Tid. Spring-fee Mixture o	al d Lorigips	Stream Type Warmwater Catchment Area km²	

WATERS FEATUR		☐ Fores	Pasture Industri	rcial al	Local Watershed NPS No evidence Q Som Obvious sources Local Watershed Eros None Moderate	lesidet hand
RIPARIA VEGETA (18 meter	TION	dicate the dominant type and record the dominant species present O Herbaceous dominant species present				erbaceous
INSTREA FEATUR 51 WQ 2" 1		Estima: Sampli: Area in Estima:	red Stream Width ng Reach Area km² (m²x1000) red Stream Depth Velocity	toring to the second of the se	High Water Mark &vel Vel Proportion of Reach R Morphology Types Riffle % Prool W % Channelized Yes	y shaded O S
LARGE V DEBRIS	YOODY	LWD Density	of LWDn	n²/km² (LWD/	reach area) NO	
AQUATIC VEGETATION Indicate the dominant type and record O Rooted emergent O Rooted sub O Floating Algae dominant species present Portion of the reach with aquatic vegets				ooted submerge ttached Algae None	ent O Rooted floating	☐ Free floating
WATER (QUALITY	Specific Dissolv pH 3. Turbidi	rature 24,6% c Conductance 477. ed Oxygen 7.18 ty 6.4 N7 U trument Used YS	. ,	☐ Fishy ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	Other
SEDIMEN SUBSTRA		Odors Norm Chem	ical Anaerobic	Petroleum None		Other 100hle
		Qils Ø Abser	nt 🗅 Slight 🚨 Modera	te 🔾 Profu	are the undersides blace	h are not deeply embedded, k in color?
INC	ORGANIC SUBS		COMPONENTS 00%)		ORGANIC SUBSTRATE C (does not necessarily add	
Substrate Type	Diamete	er	% Composition in Sampling Reach	Substrate Type	Characterístic	% Composition in Sampling Area
Bedrock Boulder	> 256 mm (10")		0	Detritus	sticks, wood, coarse plant materials (CPOM)	1590
Cobble Gravel	64-256 mm (2.5"-10") 2-64 mm (0.1"-2.5")		0	Muck-Mud	black, very fine organic (FPOM)	95%
Sand Silt Clay	0.06-2mm (gritty) 0.004-0.06 mm < 0.004 mm (slick)		1009	Marl	grey, shell fragments	0
				L .	S	me led ma

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

LOCATION TPSD-TTADO3
STREAM CLASS
RIVER BASIN
AGENCY
Rosiu, O'Ne. 1
TIME 11:30 AM PM TOTAL SAME AND AGE

 Sel
UFOG

	Habitat Parameter		Condition	ı Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	I. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
ach	SCORE	not transient).	high end of scale).	100+9+-85-76-6	15 A 32 35 1 10
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat, no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
uate	SCORE	20%,419 = 18 5 17 - 16	9531Ca19 12 11	100.9 (8) T. 6	JF 44 35 23 1 5 0".
ers to be eva	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
tme fe	SCORE	20 - 19 - 18 - 17 2 165	36.214.213.12 ip	-10 9 -8 17 6-	15 C 4 213 422 1 1 20
Parar	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	201319 8 181 19 4-16 3	45.80.80 0.800.00000000000000000000000000	1)Q: 89. 83. 17m. 64	SREA (1) 2320 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 (18) 17 16	15814 113 12 11	10 9 8 7 67	5 4 3 2 51 7 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Chamelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE	20 19 18 17 16	和对数数字(2) (3)	10 - 9 - 8 - 7 7 6	25 4 3 2 1 0
pling reach	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight, waterway has been channelized for a long distance.
E .	SCORE	2070198618543 2 18	STATEMENT AND	如0至9河南州州海东	5 4.13(22)15:0
be evaluated broader than sampling reach	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
1 2	SCORE (LB) SCORE (RB)			数1为44分割至 123 。43日全	17 2 3 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Parameters	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE (LB)	Left Bank 500 98			PROTEST OF
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12- 18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE (LB)	Left Bank 10 9	8 7 6	(3) 4 3	2 1 0
	SCORE (RB)	Right Bank 10 9	8.557 6	(5) 4 3	2 1 2 0 6

Total Score 93

STREAM NAME	15 Brook	LOCATION	IP5	D-TTO4		1
STATION # SOTTOY R	IVERMILE	STREAM CLA				
LAT LO	ONG	RIVER BASIN	1			
STORET#		AGENCY				
INVESTIGATORS (ologits O'	Moll	No SK	ins		1
FORM COMPLETED BY	<	DATE 9:30	26 	REASON FOR SURVEY		
<u> </u>		I		1 1100 20		i
WEATHER CONDITIONS	Now Storm	(heavy rain)	Past 24 hours	Has there been a heavy ra		
-	rain (shower: %0 %c	steady rain) s (intermittent) loud cover ear/sunny	0 2 20 8 0 8	Air Temperature 80° C		
SITE LOCATION/MAP	Draw a man of the sit	e and indicate th	o areas camp	led (or attach a photograph	0 - 5	ļ
	Of M	Red Cavara	/ NO	Janus)	Dograd	Stake
	,		Sav	pled in 12 of	Stoice	
STREAM CHARACTERIZATION	Stream Subsystem Perennial Inte	ermittent 🖸 Tid	lal	Stream Type Coldwater Warmw	ater	
	Stream Origin Glacial One-glacial montant Swamp and bog	☐ Spring-fe	:d	Catchment Area	km²	

1104

WATERS FEATUR		20 Field	VPasture ☐ Industr cultural ☐ Other	ercial ial	Local Watershed NPS No evidence	ne potential sources
RIPARIA VEGETA (18 meter	TION	Jadica Tree domin	te the dominant type and S Bant species present	d record the dehrubs	ommant species present A Grasses DH Specific I allow (e)	erbaceous
INSTREA FEATUR		Estima	ted Reach Length ted Stream Width ng Reach Area	Hm.	Canopy Cover Part Part High Water Mark	ly shaded O Shaded
cen cha 1.3	1.6ft -	Estima	ted Stream Depth 0.3 e Velocity	n/sec	wrothuotoff 1 ihea	O No.
LARGE V DEBRIS	WOODY	LWD Density	m² ∠5	70 St., n³/km² (LWD/	cks, fuser	,
AQUATION VEGETA		domin:	ing Algae 🔲 A	ttached Algae	lary grass	☐ Free floating
WATER	QUALITY	Tempe Specifi Dissolv pH	rature 2012 °C c Conductance 405, ed Oxygen 5,9°C ity 6,10°T strument Used	ODELCA	Water Odors St Normal/None Sew Petroleum Fishy Water Surface Oils	1 Chemical 1 Other 2 Globs Flecks
SEDIMENT/ SUBSTRATE Odors Normal Chemical Anaerobic Other Oils Absent Slight Moder			Anaerobic	2201	Looking at stones whic are the undersides blac	Paper fiber O Sand Other ADD O h are not deeply embedded, k in yolgr?
INC	ORGANIC SUBS	TRATE	COMPONENTS		ORGANIC SUBSTRATE C	
Substrate Type	Diamete	r	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Q	Detritus	sticks, wood, coarse plant materials (CPOM)	15
Boulder Cobble	> 256 mm (10")					10
Gravel			<u> </u>	Muck-Mud	black, very fine organic (FPOM)	85
Sand	2-64 mm (0.1"-2		200	 		
Silt	0.06-2mm (gritt) 0.004-0.06 mm	,	£0/7	Marl	grey, shell fragments	\wedge
Clay	< 0.004-0.00 mm (stic	(k)	5/11	1		

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME Hall'S Brook	LOCATION IPSD-TTO4
STATION # SOTTOY RIVERMILE	STREAM CLASS
LAT LONG	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS Roberts. Hostin	ns O'Neil
FORM COMPLETED BY POSON 15	DATE 6/26 TIME 9:30 AM PM TION SOME DING

Γ	П	Habitat		Condition	Category	
		Parameter	Optimal	Suboptimal	Marginal	Poor
		1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
1	盲	SCORE	70 2 19 50 14514506	MAN SALES	10, 19e1 80 hres.67	设。- 4 · 2 · 2 · 2 · 2 · 2 · 2 · 2 · 2 · 2 ·
	be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	ž Kn	SCORE	20 . 19 . 18 - 17 16.	35 (O. 3) 3-12-11	(10-,-9 _L : 8 76	5 4 3 2 1 i 0
	Parameters to be eval	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
	mete	SCORE	2019 19 年 18 14 12 12 12 12 12 12 12 12 12 12 12 12 12	20 04 304 \$0.54C 12 12 11 18	70.4.910. 845.77 (6)	45 4 3 2 2 4 PCO
	Para	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of	Heavy deposits of fine material, increased bar development, more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
					pools prevalent	and the second second second
		SCORE	205-15-3-183-17-346		可以49数(8)。这种音乐	\$55,4853% \$1\$1.50°
,		5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
		SCORE	20 (19) -18 117 16	315:13 613 12 11	10 9 8 7 6	15 4c, 3 -20 16 0

recent rains, high water level high pacipin June

14 ·

1104

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

	Habitat		Condition	Category	
ing reach	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE	20 (19) 18 17 16		40 9 8 T 6	5 4 3 2 1 0
	7. Channel Sinuosity	considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length to times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight, waterway has been channelized for a long distance.
TES L	SCORE	20 to 19.70180s. 17.7216.	1543 43434 027115	40). 9 1 7 6.	.5. 4 3 .2⊗JQ±
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank) Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.		Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has
to be eva	SCORE $\frac{ O }{ D }$ (LB)	Left Bank \$10 29 Right Bank (10 9	3 8acal 745 6cm.	5 4 3	erosional scars.
Parameters to	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE $\frac{D}{L}$ (LB) SCORE $\frac{Lb}{L}$ (RB)	Left Bank 20 2		ANTERNATION OF THE PARTY OF THE	n 2 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12- 18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE/(LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
	SCORE (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0

Total Score 149

STREAM NAME LOOK	Mysticidate LOCATION UNIOS FOIF GOY IPSD-TTUFO
STATION # TTUE 21	
LATL	ONG RIVER BASIN
STORET#	AGENCY
INVESTIGATORS R	blets, Mill. Rosin.
ROBES +5	DATE 6/27/01 TIME 9:30 (AM) PM Triad Survey
WEATHER CONDITIONS	Now Past 24 Has there been a heavy rain in the last 7 days? hours Yes No Showes 6/24
-	Storm (heavy rain) Air Temperature Storm (steady rain) Air Temperature Storm (steady rain) Other Oth
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)
	JE-02
	A003
	I w k for kird
STREAM CHARACTERIZATION	Stream Subsystem Perennial
	Stream Origin Glacial Non-glacial montane Swamp and bog Catchment Area km² Mixture of origins Other
	unknown

WATERS FEATURI		Predom D Forest Field/ Agric Resid	Pasture	rcial al	Local Watershed NPS No evidence Som Obvious sources Local Watershed Eros	Pollution e potential sources awns dintary foadways ion Heavy
RIPARIA VEGETA (18 meter, eus S	TION	Indicate Trees domina	Indicate the dominant type and record the dominant species present Trees A Shrubs A Grasses Herbaceous dominant species present Silver Maple Wick Hours Mark 9/955			
INSTREA FEATURI			ed Reach Length	m	Canopy Cover Partly open Partl	y shaded O Shaded
0	20,030	Samplir Area in	ng Reach Area km² (m²x1000) ed Stream Depth	<u>~~</u> "	High Water Mark Proportion of Reach R Morphology Types ORiffle % Pool 1/20 %	nation high mark epresented by Stream
		Surface (at thair		√sec J	Channelized Yes Dam Present AYes	المحمَّة ال
LARGE V DEBRIS	VOODY	LWD Density	LWDm²			
AQUATIO VEGETA		☐ Roote		ooted submerge	nt 🚨 Rooted floating	☐ Free floating
	:	domina	nt species present	one i	O% Lilies	2a
		Portion	of the reach with aqua	tic vegetation _	0% Lilies	N2m ano
WATER (QUALITY	Temper	ature <u>22.19</u> ° C		Water Odors	
ļ	<i>/</i> /	Specific	Conductance 369.	.00 MS/	✓ Wormal/None □ Sew ☐ Petroleum ☐ Fishy	Chemical
<u>@</u>	6	Dissolve pH <u>7</u>	ed Oxygen 2.57	opm ()	Water Surface Oils	Other Globs D Flecks
		1	strument Used YS	7 6	Turbidity (if not meas Clear Slightly to Opaque Stained	ured) irbid 🕒 Turbid 🔾 Other
SEDIMEN SUBSTRA		Odors Norm Chem	nical Anaerobic	D Petroleum D None	Deposits ☐ Sludge ☐ Sawdust ☐ Relict shells	ロ Paper fiber ロ Sand 1 Other <u>Alo x J</u> Q
		Oils Abser	nt 🔾 Slight 🔾 Modera	ite 🖸 Profu	are the undersides black	th are not deeply embedded, tk in color?
INC	INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)					
Substrate Type	Diamet	er	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			0	Detritus	sticks, wood, coarse plant	1-4
Boulder	> 256 mm (10")	1	\circ		materials (CPOM)	L590
Cobble	64-256 mm (2.5	"-10")		Muck-Mud	black, very fine organic	9-7
Gravel	Gravel 2-64 mm (0.1"-2.5")			1	(FPOM)	73/0

super frest, cormorant

0.06-2mm (gritty)

0.004-0.06 mm < 0.004 mm (slick)

Silt

Marl

grey, shell fragments

HABITAT ASSESSMENT FIELD DATA SHEET--LOW GRADIENT STREAMS (FRONT)

STREAM NAME MYSTIC Loice	LOCATION UND-GLOSOY IPSD-TTUFO2
STATION # TTUFO RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS ROBERTS OIM	eill Rosie
FORM COMPLETED BY	DATE 6/27/01 REASON FOR SURVEY TIME 9:30 AM PM Triad Samoling

	Habitat		Condition	Category	
	Parameter	Optimal	Suboptimal -	Marginal	Poor
Parameters to be evaluated in sampling reach	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed & NO	Less than 10% stable habitat, lack of habitat is obvious; substrate unstable or lacking.
		potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	yet prepared for colonization (may rate at high end of scale).		
	SCORE	20: 19: 18 7 17 16	和3時間約30-12(11)	.10 9 3 8 7 7 July 6 3	Sin4 (31.95 12.0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 -19 - 18 - 17 - 16.	3 14 13 12 11	10 . 9 (8) 75 6	5 4 3 2 × ≠13 0
ers to be eval	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.
mete	SCORE	20 19 18 17 16	13:41413 12 11	10 9 8 7 6	5 4 2 2 1 0
Paran	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected, sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pool almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16.	引3部4号13 12 11	-107-9 8 T.7. 6.	5 4 (3) 2 11 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or rifile substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 (18) 17 16	15: 14: 13: 12: 11:	10 9 8 7 6	5 4 3 2 1 0

Allmud

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

	Habitat	Condition Category							
	Parameter	Optimal	Suboptimal	Marginal	Poor				
	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.				
	SCORE	20 19 18 17 16	5500 20 (1) 15	io 9 8 7 7	5 4 3 2 41 0				
ngreach	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.				
затр	SCORE	20 19 18 17546	HISTORY WILLIAM	10. 9. 8 2.7 6	5 4 3 (2)1 3 Q				
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.				
to be eva	SCORE (LB) SCORE (RB)	Left Bank 10 9 Right Bank 10 9	ONE SECTION	23 34 7 151	2 1 0.7				
Parameters to	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.				
	SCORE (LB)	Left Bank 101-9		diesected to conserve					
	SCORE (RB)	Right Bank + 10 10	新教教室	はいいからから	第6条件与条6条				
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12- 18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.				
	SCORE (LB)	Left Bank 10 9	8 7 6	(5) 4 3	2 1 0				
	SCORE (RB)	Right Bank 10 9	8 7 6	(2.5) 4 3	2 1 0				

Total Score 95

Sea wall on Singra Jan dow Stream

STREAM NAME JUC	leins fond	LOCATIONIPS D-1106 D3
STATION#TTO603 R	IVERMILE	STREAM CLASS
LATL	ONG	RIVER BASIN
STORET #		AGENCY
INVESTIGATORS R	pherts, Hos	Kins O'Neill
FORM COMPLETED BY	,	DATE 1612 6 O REASON FOR SURVEY
Kobert	2-	Time 30h AM PM Triad Sanoling
WEATHER CONDITIONS	Now	Past 24 Has there been a heavy rain in the last 7 days?
		hours QYes QNo (heavy rain) Q Showed 6/2/ steady rain) Q Air Temperature 90°C
	☐ showers	(intermittent)
!		loud cover % % % % % % % % % % % % % % % % % % %
SITE LOCATION/MAP	Draw a map of the site	e and indicate the areas sampled (or attach a photograph)
	1 / /	
	JAT M	
,	3/10/	W S
Sompled about		T. A. T. A.
South)		X Qii/ I
about	11/4/	
od Chads	200	The state of the s
1:197	12 -	74 118 89 18
	17 1 2	
	MAF	A Maria Maria Service
		18X X2
	1/4	3
		3
		×, ×
	``	
	\ \	
	1	A REAL
	``	
		(
STREAM	Spream Subsystem Spream Inte	Stream Type /
CHARACTERIZATION	/ `	ermittent 🗆 Tidal 🗎 Coldwaler Warmwater
	Stream Origin	Catchment Areakm² O Spring-fed O Mixture of origins
	☐ Non-glacial montane ☐ Swamp and bog	Mixture of origins Other Line Y

WATERS FEATUR		☐ Field	1/Pasture Industricultural Other	ercial ial 🔺	Local Watershed NPS No evidence ASom Obvious sources Local Watershed Ero None A Moderate	ne potential sources load/Stormulation sion		
RIPARIAN VEGETATION (18 meter buffer) Indicate the dominant type and record the dominant species present Virges Offices Offices Company of the moved of the dominant species present Offices Office								
Estimated Reach Length Estimated Stream Width Sampling Reach Area Area in km² (m²x1000) Estimated Stream Depth Surface Velocity			ted Stream Width 25 ing Reach Area 2- in km² (m²x1000) 30 ited Stream Depth 30 ited Stream Open 30	F-4 P+		MNO ONLY at out	e+ ~	
		e (sttha.	Standa	g hotel	Dam Present 🗘 Yes		Mill to	
LARGE V DEBRIS	WGODY	LWD Density		age 5+1	icks in dreda	2	·	
AQUATIC VEGETATION Indicate the dominant type and record the dominant species present Rooted emergent Rooted floating Free floating Attached Algae								
		domina	ant species present 54	raddud	ck (Vuo har hatem	1)		
		Portion	۱ of the reach with aqual	tic vegetation	%	,		
WATER	QUALITY	Tempe	rature 24.74°C		Water Odors			
aso r	0.45		c Conductance 492,0	30.56 m	Normal/None 🗆 Sew	age Chemical		
5.7	5.2		ed Oxygen 7,67 0		O Fishy	Other		
33,	Jest.	рН		T "	Water Surface Oils □ Slick □ Sheen □	Globs □ Flecks	J	
10000	6	1 -	ity 16,1 NTU		None Other			
3,.	254		strument Used 15T		Turbidity (if not meas Clear Clear Slightly to Opaque Cleaned	ured) Irbid 🔲 Turbid 🔲 Other		
SEDIMENT/ SUBSTRATE Odors Normal								
Oils Cooking at stones which are not deeply embedded, are the undersides black in color? Absent O Slight O Moderate O Profuse O Yes O No								
	>DC 13/20 00:00							
INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) (does not necessarily add up to 100%)								
Substrate Type			% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area		
Bedrock			0	Detritus	sticks, wood, coarse plant	1 100		
Boulder > 256 mm (10")			0		materials (CPOM)	Z1090		
Cobble	64-256 mm (2.5	"-10 ")	0	Muck-Mud	black, very fine organic	909.		
Gravel	2-64 mm (0.1"-2	5")		1	(FPOM)	10/00		

Silt

0.06-2mm (gritty)

0.004-0.06 mm < 0.004 mm (slick) 20

ED.

Mari

grey, shell fragments

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME JICKS FOR &	LOCATION IPSD - TTO603
STATION # TT06-0 3 RIVERMILE	STREAM CLASS
LATLONG	RIVER BASIN
STORET#	AGENCY
INVESTIGATORS Kozents Haki	S. O'Nell.
FORM COMPLETED BY KODET + S	DATE 6/240 REASON FOR SURVEY TIME 2:30 AM PM

	Habitat	Condition Category							
ĺ	Parameter	Optimal	Suboptimal	Marginal	Poor				
	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.				
cach	SCORE	TO BE DESIGNATED IN SIGNATURE		40 - 92 8 27 pa 6	S. Andreal Land				
Parameters to be evaluated in sampling reach	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Is, with gravel and or clay; mud may be dominant; some root mats and submerged vegetation present.		Hard-pan clay or bedrock; no root mat or vegetation.				
uate	SCORE	2014/12/2018/2017/14/16	10 14 17 12 11 ·	10229 (8) 74 6	∔5∓ 4€÷3₹ 2≤4\$↓° 0				
rs to be evalu	3. Pool Variability	Even mix of large- shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large- deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small- shallow or pools absent.				
Ē	SCORE	20 19 181 17 16	15 ja 13 12 11	.10 9 8 7 6	5 4 3 2 1 0				
Рагап	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development, more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.				
	SCORE	20 - 19 18 17416	APPENDED TO THE	4.A	5 44 3 (2) 1 0				
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.				
	SCORE	20) 19 - 18 - 19 3-16	*159914 (2) 3 12 11	(10:1-9v 8 : 7 × 6	5-4=9-21-14-0				

pord

HABITAT ASSESSMENT FIELD DATA SHEET-LOW GRADIENT STREAMS (BACK)

١	Habitat	Condition Category							
ı	Parameter	Optim21	Suboptimal	Marginal	Poor				
	6. Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern.		Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.				
	SCORE	20 19 18 17 16	(15) 42-13-12-11	10 9 8 7 6	5 4 3 2 1 0.				
Parameters to be evaluated broader than sampling reach	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other tow-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.				
	SCORE	20 **19 x 18 - 17 ** 16	315@140+136-12.01U	102 9 8 7 6	5 4 3 (2) 1 0				
	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.				
eva	SCORE (LB) SCORE (RB)	Left Bank 10 9	a 8 1/2) 4 6 m	5-4-4-4-3	2 - 19 - 0 -				
to be		Right Bank, 10 9	82 (1) 6 4	5 4 3	2 1 0 3				
Parameters to	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.		50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.				
	SCORE (LB)	Left Bank		(5) 4 3	2 1 0 %				
	score <u>5</u> (rb)	Right Bank 4510 92	PARTER OF 612	4(3)=4:00 3:01	2 2 20 d 2 10 0 0				
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12- 18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.				
	SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 (1) 0				
	SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 (1) 0				

Total Score 74

East version

					Ved W	ellar	
	1's Brook	LOCATION	IPSI	1-HB00	0		
STATION # IPSO HOAR	VERMILE	STREAM CLA	SS				
LATLC	ONG	RIVER BASIN	1				
STORET #		AGENCY	,				
investigators Q_{ϕ}	ners O'N	eill Hos	KNIS				
FORM COMPLETED BY	, , , , , , , , , , , , , , , , , , , ,	DATE 6/2 TIME 11:5	bloi	REASON FOR SURV	EY		
Koberts	<u> </u>	TIME 11.5	AM) PI	Triad	Samo	11116	
					1		
WEATHER CONDITIONS	rain (showers%Q %cl	(heavy rain) steady rain) s (intermittent) loud cover ear/sunny	Past 24 hours O O O O O O O	Has there been a heavy (A) Yes No 6 Air Temperature 90 0	rain in the last 7 da MOWES (
SITE LOCATION/MAP	Draw a map of the sit	e and indicate the	Dari	pled (or attach a photogra	ph)		
	PEN YEN	Show (Side)	J. Jewinsola				<i>(</i>
STREAM CHARACTERIZATION	Stream Subsystem Perennial 7 Into Stream Origin Glacial Non-glacial montane Swamp and bog	☐ Spring-fe	ial	Stream Type Coldwater Catchment Area	nwater km²		Cartarit

WATERS FEATUR		Predominant Surrounding Landu Forest					
RIPARIAN VEGETATION (18 meter buffer) Indicate the dominant type and record the dominant species present Afferbaceous dominant species present Location Cattain						erbaceous Uf Cattaily	
INSTREA FEATUR							
LARGE V DEBRIS	MOODA	LWD Density	of LWD	DJ B	ranchos in cl	rames.	
AQUATIO VEGETA		Indicate the dominant type and record the dominant species present ORooted emergent ORooted submergent ORooted floating OFree floating OROOTED Attached Algae					
		Portion of the reach with aquatic vegetation 0%					
WATER	QUALITY	Temperature 74.00 Specific Conductance 34.00 Specific Conductance 9 Petroleum Chemical Other Dissolved Oxygen Other PH 7.01 Turbidity Sheen Globs Flecks None Other Turbidity (if not measured) Clear Slightly turbid Turbid Clear Slightly turbid Other Opaque Stained Other Opaque Other Op					
SEDIME! SUBSTRA		Odors Other					
		Oils Abse	nt 🔾 Slight 🔾 Modera	ite 🔾 Profu	are the undersides blac	th are not deeply embedded, ick in color?	
INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)						COMPONENTS up to 100%)	
		% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area		
Bedrock				Detritus	sticks, wood, coarse plant		
Boulder	er > 256 mm (10")		\mathcal{Q}		materials (CPOM)	140%	
Cobble	e 64-256 mm (2.5"-10")		Q	Muck-Mud	black, very fine organic		
Gravel	el 2-64 mm (0.1"-2.5")		0	1	(FPOM)	160%	
Sand	0.06-2mm (gritt	y)	0	Marl	grey, shell fragments	10	
Silt	0.004-0.06 mm		100%				
Clay	< 0.004 mm (sli	ck)		1			

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT STREAM NAME Hall'S LOCATION STATION # HBOO RIVERMILE STREAM CLASS LAT_ LONG RIVER BASIN STORET# AGENCY INVESTIGATORS FORM COMPLETED BY DATE REASON FOR SURVEY TIME Habitat Condition Category Parameter Optimal Suboptimal Marginal Poor Greater than 50% of 30-50% mix of stable 10-30% mix of stable Less than 10% stable 1. Epifaunal substrate favorable for habitat; well-suited for habitat: habitat habitat; lack of habitat is Substrate/ epifaunal colonization and full colonization potential; availability less than obvious; substrate Available Cover fish cover; mix of snags, adequate habitat for desirable; substrate unstable or lacking. submerged logs, undercut maintenance of frequently disturbed or banks, cobble or other populations; presence of removed. stable habitat and at stage additional substrate in the form of newfall, but not to allow full colonization potential (i.e., logs/snags yet prepared for that are not new fall and colonization (may rate at high end of scale). not transient). 204 - 19 - 48 - 17 - 18 10 9 8 9 8 Parameters to be evaluated in sampling reach 35.4.3.2240-10 **SCORE** Mixture of substrate Mixture of soft sand, mud, All mud or clay or sand Hard-pan clay or bedrock; bottom; little or no root 2. Pool Substrate materials, with gravel and or clay; mud may be no root mat or vegetation. mat: no submerged firm sand prevalent; root Characterization dominant; some root mats mats and submerged and submerged vegetation vegetation. vegetation common present 135 147 8 13 L 112 (11 10 9 8 76 6 20 19 - 18 4 17 4 16 54 4 3 3 2 1 LuO SCORE Even mix of large-Majority of pools large-Shallow pools much more Majority of pools small-3. Pool Variability shallow, large-deep, prevalent than deep pools. shallow or pools absent. deep: very few shallow. small-shallow, small-deep pools present. 20 197-18 17.0-16 15 14 13 12 11 SCORÉ 10 9 8 20 0 6 5. 4. (33. 2 - 17E0 Little or no enlargement Moderate deposition of Heavy deposits of fine Some new increase in bar new gravel, sand or fine material, increased bar 4. Sediment of islands or point bars formation, mostly from and less than <20% of the gravel, sand or fine sediment on old and new development; more than Deposition bottom affected by sediment; 20-50% of the bars: 50-80% of the 80% of the bottom bottom affected; slight bottom affected; sediment changing frequently; pools sediment deposition. denosits at obstructions. almost absent due to deposition in pools. substantial sediment constrictions, and bends: moderate deposition of deposition. pools prevalent. 10 4 9 8 8 10 6 35 2 419-3 202121-0 20 - 19 - 18 - 17 - 16 - 20 - 19 - 3 - 12 - 11 -SCORE

Water fills >75% of the

<25% of channel substrate

available channel; or

is exposed.

20) - 19 - 18 - 17 元 16 - 13 12 - 11

Water fills 25-75% of the

available channel, and/or

riffle substrates are mostly

-10 - 9 8 7 6

exposed.

Very little water in

channel and mostly

present as standing pools.

5 = 4 a 3 - 2 - 1ch 0

Water reaches base of

both lower banks, and

minimal amount of

channel substrate is

exposed.

5. Channel Flow

Status

SCORE

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

П	Habitat	Category			
	Parameter	Optimal	Suboptimal	Marginal	Poor
	6. Channel Alteration			Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
	SCORE	(20) 19 18 17 16:	15, 14, 912012, 11	10 9 8 7 6	5 4 3 2 1 0
pling reach	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length Fto 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance
E	SCORE	201:19 : 18 : 17 616	15501465 (332 1275) (3	10, 9(8) 17, 561	5 4 3 2 1 0
Parameters to be evaluated broader than sampling reach	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30- 60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
to be evali	SCORE (LB) Left (RB) Righ	Left Bank 10 9 Right Bank 70 9	1.38.40.40.60.60.	5 74 3 3	
Parameters	9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow pagurally.	potential plant stubble height remaining.	surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
	SCORE $\frac{10}{11}$ (LB) SCORE $\frac{10}{11}$ (RB)	TARRETTE (AID) OF	Control of the Contro		14. 2 1. N 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12 18 meters; human activities have impacted zone only minimally.		Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
	SCORE(LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
	SCORE(RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 133



FIELD NOTES FOR JUNE 2001 WELLS G&H TRIAD SAMPLING

The following field notes were compiles in order to detail the sampling activities in support of the triad sampling at Wells G&H between June 18 and June 27, 2001. These notes are organized in chronological order. Physical Characterization and Habitat Assessment Field Data Sheets for each of these locations were also completed for each station.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-SD-WH-07

Date: June 18, 2001 **Time:** 11:10 am

Weather: Sunny, 80°F, light breeze

Sampling team met at the MA Rifle Association parking log, at the end of Rifle Range Road in Woburn, at 9:15 am. The first station sampled, west of the rifle range, was the TTNUS sample location WH07. The station is located at the edge of the red maple swamp along the eastern border of the Well G& H 23-acre wetland. There had been heavy rains (estimated at 2.5 inches) in the last 24-hours. Water levels in the wetland were high for June due to this rain event, as evidenced by the depth of water around emergent vegetation including sensitive ferns. The site appears to be a seasonally inundated palustrine forested wetland. The open emergent marsh, dominated by common reed (*Phragmites australis*) is located approximately 50 ft to the west.

The sediment samples were collected in 1.2 ft of water, just west of the WH07 stake. The sediment was dark muck with a high content of coarse particulate organic matter. The three samples sieved for benthic community analysis were composed predominantly of leaf litter. A layer of moss was present floating just above the sediment surface. There was no observable flow of water at the site.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-SDTT-22-01

Date: June 18, 2001 **Time:** 3:30 pm

Weather: Sunny, 85°F, light breeze

Station SDTT 22-01 was access through the northern fence of the Rifle Association property. The former stake marking TTNUS's sampling location was located. The area in the vicinity of the sample site is a palustrine forested wetland, dominated by red maple (*Acer rubrum*), swamp azalea (*Rhododendron viscosum*), and skunk cabbage (*Symplocarpus foetidus*).

The sample was collected within a small channel (2 ft wide) with slow, but detectable flow, through the red maple swamp. The banks were densely vegetated with maples, shrubs, and a herb layer dominated by skunk cabbage, cinnamon fern (Osmunda cinnamomea), jewelweed (Impatiens capensis) and lurid sedge (Carex lurida). In the channel itself, emergent and submersed aquatic vegetation was absent. The sediment was composed of dark highly organic muck with a high content of coarse particulate organic matter. In the samples sieved for benthic

community analysis, small beads, presumed to be lead shot from historic rifle range activity were found. The access road, which parallels the wetland to the east was covered in buck shot.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-SDTT-12-03

Date: June 19, 2001 **Time:** 9:30 am

Weather: Sunny, 80°F, light breeze

Station SD 12-03 along the secondary channel of the Aberjona River near Well H in the 23-acre wetland. This location was characterized as a stream habitat and was collected in a depositional area of a side channel along the edge of the emergent marsh. The marsh vegetation was dominated by narrow-leaved cattail (*Typha angustifolia*), purple loosestrife (*Lythrum salicaria*) and tussock sedge. A few shrubs adjacent to the sampling location included button-bush and elderberry (*Sambucus canadensis*), although the area was generally open emergent marsh.

The sediment was composed of dark organic muck, with a high proportion of coarse particulate organic matter consisting mainly of cattail fragments. The main channel of the stream at this location was approximately 5-8 feet wide with moderate flow and 4 ft deep at the center. The small side channel where the sample was collected was 0.8 to 1.2 feet deep. The emergent marsh adjacent to the sample area is covered in dense vegetation and pockets of water.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-SDTT29-03

Date: June 19, 2001 **Time:** 11:50 am

Weather: Sunny, 85°F, light breeze

SDTT-29-03 is south of Well H on the east branch of the river within the 23-acre wetland. This location was characterized as a stream habitat, and was collected adjacent to a small inlet in the wetland which forms a pool bordered by emergent wetland. The stream channel is distinct, deeper and wider than at SD-12-03. There is no canopy and few shrubs. The wetland vegetation is dominated by tussock sedge (*Carex stricta*), purple loosestrife and some cattails. The sediment was collected at a depth of 0.8 to 1.2 feet of water. The sediment was composed of dark organic muck with fine roots and slightly less undecomposed cattail fragments.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-SDTT-19-01

Date: June 19, 2001 **Time:** 2:30 pm

Weather: Sunny, 90°F, light breeze

Station SD19-01 is in the 23-acre wetland west of Well G. This wetland sediment sample was

located in a isolated pocket or channel in the emergent wetland among tussock sedge. This open channel in the emergent wetland is not directly connected to the main channel of the river. The sediment samples were collected at a depth of 0.8 feet. Sediment consisted of dark organic muck with a higher content of fine particulate organic matter. Some orange floc was noted on the surface of the sediment. There was no tree or shrub cover. A dense stand of *Phragmites* is located to the north, but in the vicinity of the sample, the vegetation was primarily sedges. The original Foster-Wheeler sample was taken near this location. The M&E (1997) sample was collected closer to the forested wetland to the east.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-TT33-02

Date: June 20, 2001 Time: 11:20 am

Weather: Sunny, 80°F, light breeze

Sample site TT33-02 is just off the main channel of the Aberjona River near the southern end of the former Cranberry Bog, south of Salem Street. This wetland habitat was located along a minor side channel (east-west). The substrate was difficult to sample with the dredge because of the fibrous roots and particulate organic matter. The sediment was black organic muck with a higher sand component than many of the wetland samples. The dominant vegetation in the vicinity of the sample station included tussock sedge and purple loosestrife. The emergent marsh was mainly open in this area, but a few shrubs, mainly silky dogwood (Cornus amomum) were located adjacent to the sample location.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-TT32-02

Date: June 20, 2001 **Time:** 2:00 pm

Weather: Sunny, 90°F, light breeze

Sample station TT32-02 was also located within the former Cranberry Bog, north of TT33-02. The station was very similar in character to the wetland sample collected at TT33-02. The sediment was collected at the mouth of one of the small side channels to the main stream. There was almost no flow in the channel and the sediment was collected in a depositional area 0.4-0.8 ft of water depth. The vegetation bordering the sampling location was dominated by emergent, hummock-forming grass, and purple loosestrife. The sediment consisted of organic muck and some sand. The organic content and fine root fraction was also high, making dredging difficult. The dredge pressed in 6 inches into the substrate and frequently recovered only 2-3 inches of material for the chemistry and toxicity samples.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-WW-06

Date: June 21, 2001 **Time:** 8:55 am

Weather: Cloudy, 70°F, light breeze

Station WW-06 is located along the eastern edge of the Wildwood Property. The station is at the out edge of the narrow forested wetland that borders the gravel cap for the treatment system at Wildwood. The sample was collected among clumps of emergent wetland plants including sensitive fern (*Onoclea sensibilis*) and purple loosestrife. The location is partially shaded by red maple trees and a few shrubs (norther arrowwood) were located adjacent to the sampling area.

The sediment was black organic sediment with many fine roots and cohesive structure. In order to get a sample, the jaws of the dredge had to be manually pushed closed. Water depth was 0.5 - 1.0 feet. The area appears to be a seasonally inundated location.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-TT-18-02

Date: June 21, 2001 **Time:** 2:30 pm

Weather: Cloudy, 75°F, light breeze

The sample station was located on the east side of the Aberjona River and determined by the GPS co-ordinates for SD-18-02 recorded by M&E. The station was accessed by launching a boat from Wildwood. The location is a small inlet along the main river channel. The vegetation along the bank was dominated by tussock sedge and purple loosestrife. The banks of the stream are emergent marsh with a few red maple saplings present. The sediment was black organic muck, with a high content of fine particulate organic matter. Samples were collected in water 1.1 ft deep.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-SDTT-10-02

Date: June 22, 2001 **Time:** 8:45 am

Weather: Cloudy, 75°F, light breeze

Sampling location SD-10-02 is located on the Aberjona River, just upstream of the bridge at Salem Street. This location is at the southern end of the 23-acre wetland and upstream of the Cranberry bog. Access was obtained through the backyard of a residence on Salem street to the west. A boat was used to collect the sample. GPS was used to locate the M&E co-ordinates for SD-10-03. This area is a wide point in the river with slow flow. The sample was collected in 1.4 feet of water at the northeast edge of a patch of water lilies (Nuphar luteum). The sediment was composed of black organic muck with a high content of coarse particulate organic matter. The

riparian vegetative zone was limited on the western bank to a narrow shrub/tree border sloping up to a mowed residential lawn. The remainder of the surrounding banks were dominated by emergent vegetation including cattails and purple loosestrife

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-SDTT-13-01

Date: June 22, 2001 **Time:** 10:45 am

Weather: Cloudy, 70°F, light breeze

The location of the stake for station SD13-01 (Foster Wheeler) was determined with GPS coordinates. The location of the former SD13-01 was in an area of a scoured channel at the western edge of the 23-acre wetland, north of Wildwood. The area was inundated with water, but a location about 15 feet to the east was selected to sample. This location was a small channel into the adjacent to the emergent wetland. The sample was collected in the open water, 0.3 - 0.4 feet deep, adjacent to clumps of purple loosestrife and jewelweed

The western bank, about 100 feet from the railroad tracks, consisted of a disturbed forest, dominated by oak. Shrubs, including northern arrowwood (*Viburnum recognitum*), were prevalent along the bank. The open water channel was about 20 feet wide and up to 2 feet deep. The sediment consisted of black organic muck, with some of the dredge samples with a higher content of peaty material.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-TT30-01

Date: June 22, 2001 **Time:** 1:20 pm

Weather: Partly cloudy, 75°F

The sample was collected in a very small inlet on the east side of the stream channel south of Salem Street. The station was accessed from a parking lot off the south side of Salem Street. There was moderate flow in the channel and slow flow at the sampling location behind a small clump of purple loosestrife. The western shoreline was a narrow band of forest including willow, red maple and gray birch. The sample was collected in an open are of emergent marsh dominated by purple loosestrife, tussock sedge and sensitive fern at a depth of 3-10 inches. The sediment was composed of back organic muck, fibrous roots, and some peat.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-SD-PP03

Date: June 25, 2001 **Time:**10:10 am

Weather: Partly cloudy, 76°F

Phillips Pond was a reference location located on the South Branch of the Aberjona River between Commercial Way and Route 93. Access was obtained from road behind the Marshall's loading docks. The pond was sampled using an Ekman dredge from a boat. Station IPSD03 is located off the southern shore about halfway up the pond. The sediment was collected at a depth of about 13 feet. Soft black organic muck was collected at the location determined from GPS coordinates provided in Menzie-Cura's data. While anchored at the same location, in some areas there was little recovery in the dredge and it felt like it was hitting hard bottom.

The pond was create in the mid-1970's. There is an active beaver dam at the outlet, and the water levels appeared to be quite high. The bordering vegetated buffer is a narrow forest (red maple gray birch, glossy buckthorn (*Rhamnus frangula*) and dogwood), with the exception of the west side, with is *Phragmites* and a bank up to the roadway. Beaver activity, muskrat and Great Blue Heron were observed at the pond. Ken Munney reported that a large number of bass were collected from this pond during the fish sampling.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-SD-TTSA01

Date: June 25, 2001 **Time:** 2:00 pm

Weather: Mostly sunny, 85°F

A new wetland reference station was selected in the Town of Reading, at the end of Arcadia Road. The station is located off the north side of the cul-de-sac at the edge of the forested wetland in a small open channel (no flow) in the emergent wetland. At the time of sampling the water depth was 0.7 ft. At the sampling location there was no canopy cover, however, to the south and west (upstream), a mix of shrub and forested wetland was dominated by red maple, and northern arrowwood. Vegetation at the TTSA01 included broad-leaved cattail, skunk cabbage, jewel weed, purple loosestrife and sensitive fern. This vegetative community was characteristic of the emergent marsh along the edges of the open channel in the wetland where the sample was taken. There was no rooted aquatic vegetation where the sediment was collected. The sediment consisted of black organic muck, on top of a sandier layer. There was a fairly high content of coarse particulate organic matter in the samples.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-TTSD01

Date: June 25, 2001 **Time:** 4:00 pm

Weather: Mostly sunny, 85°F

TTSD01 is a stream reference location on the South Branch of the Aberjona River. The station is located behind residences on Willow Street in Reading. Access to the site was obtained through the back yard of #118 Willow Road. The stream is 8-10 feet wide, with forested wetland along the east bank and emergent/shrub wetland along the west bank. Shrubs along both banks included

silky dogwood and glossy buckthorn. Trees were predominately red maple. Along the banks, the dominant herbaceous species included jewelweed and sensitive fern.

The substrate on west side of the stream channel was scoured and sandy. The sample was collected in the depositional area on the east side of the channel. The sediment was black organic muck, with some sand, and a high content of coarse organic matter. There were numerous sticks and woody debris. A few rooted macrophytes (*Ludwigia palustris*) were observed in the area of the sample collection.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-TT04

Date: 6/26/01 **Time:** 9:30 am

Weather: Sunny, 85°F

This station was a reference stream location, on Hall's Brook accessed from a dead-end street (Third Road). This station was used by Menzie-Cura for a reference stream for the Industri-Plex triad sampling. There is a distinct stream channel present through a wide emergent marsh dominated by reed canary grass. The sample was taken on the western end of the marsh in an area where the stream is bordered by a few shrubs and then flows into a forested wetland.

The sediment was collected along the reed-canary grass bank and consisted of a black organic muck. The substrate toward the center of the channel (not sampled) was sandy. Dogwood, speckled alder (*Alnus rugosa*) and elderberry were present along the northern bank. Other emergent wetland species present in the area included purple loosestrife and broad-leaved cattail (*Typha latifolia*).

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-HB00

Date: June 26, 01 Time: 11:50 am

Weather: Sunny, 90°F

This reference wetland, along Hall's Brook, was accessed from a dead-end street (Danforth) off of School Street in Woburn. The wetland was reached by going down a steep bank from the residential area and west along the bank, out to a peninsula that runs north into the wetland. The station is on the west side of the wetland adjacent to an scrub/shrub wetland dominated by speckled alder. The sample was taken in a channel in the wetland with no flow, among cattails. The water depth at the sampling location was 0.5 to 1.0 feet. The sediment was deep (approximately 2 ft) dark organic muck with coarse organic matter. The was duckweed (Lemna sp.) on the surface of the water among the cattails, and other emergent vegetation included purple loosestrife and for-get-me-nots (Myosotis scorpoides).

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-SD-TT06-03

Date: June 26, 2001 **Time:** 3:00 pm

Weather: Sunny, 90°F

The sample location for Judkins Pond was located using co-ordinates for the M&E SD-06-03 station. Judkins Pond is a small pond in the center of Winchester. The sampling location is on the east side of the pond near a patch of water lilies (*Nuphar luteum*). The sample was collected at a depth of 3.5 - 4 feet. The sediment consisted of dark black organic muck with many fine roots and some sand in the sieved benthic community samples. Undisturbed vegetation grows along the bank in a narrow buffer, but the majority of the riparian zone consists of mowed grass, buildings and roadways.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-SD-TTUF-02

Date: June 27, 2001 **Time:** 9:30 am

Weather: Sunny, 75°F

This was one of two samples collected in the Upper Forebay of Upper Mystic Lake. The eastern shore of the pond is bordered by a park, and the western shore is residential. The samples were collected by boat, launched from the park on Mystic Valley Parkway. The first sample was collected in a bay on the western shore. Many of the residences on the shoreline have seawalls. The water depth at the station was 7.1 feet. The sediment consisted of black orgains muck with little coarse organic matter. There was a patch of water lilies (Nymphea odorata) approximately 6 ft from the sample location. Lilies were prevalent elsewhere on the pond. Cormorants and geese were present on the pond. Bluegills were noted along the eastern shore, and larger fish were jumping near the center of the lake.

Project name: Wells G&H Sediment Triad Sampling 2001

Sample Location: IP-SD-TTAO-03

Date: June 27, 2001 **Time:** 11:30 am

Weather: Sunny, 85°F

The second station in the Upper Forebay was located closer to the inlet of the Aberjona River. The sample was collected at a water depth of 5 ft. The sediment was similar with some leaf matter in the samples.